

II. FIELD KEYS TO THE LIZARDS AND AMPHIBIANS OF BRITISH GUIANA.

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The keys here devised are based on field characters, and are designed for the use of the general student rather than the taxonomist. Technical language has been avoided, so far as is consistent with the desire for brevity. The writer experienced the need for such keys, when in the summer of 1924 he was collecting material for histological study at the Kartabo Tropical Research Station. This laboratory had been loaned to the University of Pittsburgh through the kindness of Dr. William Beebe.

The literature describing forms from British Guiana is so scattered, and there has been so much controversy over records of the occurrence of the forms reported for the colony, that it seems desirable to collect and analyze the data anew, study the available specimens, and include the findings in one report. For all of the species named in the keys there seems to be authentic record of collection in the colony, except possibly in the cases of *Tropidurus torquatus torquatus*, *Atelopus pulcher*, *Atelopus varius*, and *Hyla fasciata*. The specimens of *Hyla marmorata*, reported by the author in a preliminary paper in 1926, afford the first record of the occurrence in British Guiana of this Ecuadorean species. The occurrence of *Ceratophrys cornuta*, reported by Dr. Beebe and later questioned, is confirmed by a specimen collected in 1926 by Mr. J. F. W. Pearson.

The main outlines of the scheme of classification followed here are based on Boulenger's keys, with the chief exception that the suggestions of Dr. G. K. Noble for the revision of the families of Amphibia have been adopted. Also many parts of the classification depend on the work of Barbour, Stejneger, Ruthven, Burt, Cope, and Camp. An effort has been made to correlate the contributions made by these writers, in so far as they apply to the forms found in British Guiana.

The earlier work on specimens was founded on material collected

by the writer in 1924, and by others working under his direction: Messrs. George D. Morgan and E. P. Jones in 1925, Mr. and Mrs. J. F. W. Pearson in 1926. Dr. S. H. Williams, also, kindly assisted in obtaining specimens. Most of the material has been turned over to the American Museum and to the Carnegie Museum. The animals were collected at various stations through the stretch of country extending twenty-four miles from Bartica to Matope Falls, and at Amatuk, further in the interior.

The keys have been checked from many specimens in the American Museum, including the types of *Gonatodes beebei*, *Leptodactylus rugosus*, *L. minutus*, and *Hyla ornatissima*. For making this material available, for identifying several specimens, and for many helpful suggestions, the writer is greatly indebted to Dr. G. K. Noble. Mrs. Helen T. Gaige kindly checked the keys against specimens in the collection of the Museum of Zoölogy at the University of Michigan. Valued criticism was also given by Dr. Thomas Barbour of the Museum of Comparative Zoölogy, and by Dr. W. J. Holland and Mr. M. Graham Netting of the Carnegie Museum. The writer nevertheless takes full responsibility for the keys as now presented.

The writer is aware of several shortcomings in the keys. Many controversial points could not be settled with the information available. Such characters as the concavity of "forehead" in *Anolis*, or the direction of the pupil in the Amphibia are not very satisfactory, but they are difficult to replace. The pupil may be nearly round, when fully dilated, but close inspection will reveal angles in the margin, showing the direction of the slit. Several of the characters used are difficult to observe in juvenile individuals. In general, such descriptions of coloration have been made as would be applicable to both living and preserved specimens. Frequently, general descriptive material is added to supplement the statement of diagnostic points.

THE LIZARDS OF BRITISH GUIANA.

KEY TO THE FAMILIES.

I. Tongue smooth, or velvety.

- A. Eyes large, without movable lids. Skin granular. Jaw teeth small, numerous, closely set, with obtuse points. No pterygoid teeth in roof of mouth.....GEKKONIDÆ.

- B. Eyes moderate or small, with lids. Skin covered with scales. Jaw teeth conical or canine-like in front, and on the sides tricuspid or with edges finely denticulated, more or less compressed. Usually pterygoid teeth.....IGUANIDÆ.

II. Tongue covered with overlapping scaly projections, or with oblique folds.

- A. Tongue ending in two long smooth points, more or less elongate, flattened. No osteodermal plates.

1. Scales of upper surfaces granular or overlapping. Scales beneath body usually squarish and not overlapping. Eyes and eyelids well developed. Limbs present, although digits may be lacking.....TEIIDÆ.

2. Scales usually absent. Scales of upper surfaces granular when present. Eye concealed under skin. Mouth small. No visible ear. Tongue arrowheaded. Limbs absent. Body wormlike, ringed. Tail short.AMPHISBÆNIDÆ.

- B. Tongue feebly nicked in front; moderately long, flattened. Body with osteodermal plates.....SCINCIDÆ.

Family GEKKONIDÆ.

KEY TO THE GENERA.

- I. Digits not, or but slightly, dilated at the base; the two or three distal joints more or less compressed and angularly bent. Digits with series of transverse plates beneath, and all clawed. Claw between two scales, a smaller upper and a large lower one, which extends upwards around the claw on either side.
A. Pupil of eye vertical. No superciliary spines (hand lens) above eye.....*Gymnodactylus* Spix
B. Pupil round. One or more superciliary spines.
Gonatodes Fitzinger
- II. Digits entirely dilated, with a double series of thin plates beneath; clawed, the claw retractile into a median groove. Pupil of eye vertical. No superciliary spines.. *Thecadactylus* Oken
- III. Digits dilated, but the distal joints compressed. Distal joint long, free, rising from within the extremity of the digital dilation. Plates beneath digits are in a double series. Pupil of eye vertical. No superciliary spines..... *Hemidactylus* Oken
- IV. Digits dilated at apex only, with very small sheathed claw, the sheath opening laterally. Digital expansion with a circular plate beneath. Pupil of eye circular or subelliptical. One superciliary spine.....*Sphærodactylus* Wagler

KEY TO THE SPECIES.

Genus GYMNODACTYLUS Spix.

Adult about 3.25 inches long. A U-shaped dark line from eye to eye over nape. Ground-color brown, marbled with darker spots, which tend to form bands. Tubercles form fourteen very regular longitudinal series on the back.....*G. geckoides* Spix

Genus GONATODES Fitzinger.

- I. A small projecting superciliary spine above eye. Gray-brown above, a series of large black spots along each side of the vertebral zone. Frequently a light vertebral line, with large serrations extending laterally. Usually a light line, preceded by a darker spot, in front of shoulder. Pale brown beneath. Throat often with oblique brown lines converging backwards. Six or seven upper labial shields. Total length about 2.5 inches.

G. annularis Boulenger

- II. A series of three or four superciliary spines. Uniform reddish brown above. Almost immaculate beneath, no spots on throat. Five upper labial shields. A large *Gonatodes*, with narrow head. Total length about 3.75 inches.....*G. beebei* Noble

Genus THECADACTYLUS Oken.

A large grotesque Gecko, attaining length of about 7.5 inches. Head covered with small granular scales. Digits strongly dilated, half webbed. Brown or grayish brown above, variegated. Whitish beneath, immaculate.....*T. rapicaudus* (Houttuyn)

Genus HEMIDACTYLUS Oken.

Attains a length of about 6.5 inches. Hinder part of head shows mixture of fine granules and round tubercles. Digits free, with slender distal clawed joints. Gray or light brown above, with dark spots or undulating cross-bands. Whitish beneath.

H. mabouia (Moreau de Jonnés)

Genus SPHÆRODACTYLUS Wagler.

Less than 2.5 inches long. Generally with a pair of longitudinal white stripes on each side of head and body, much more distinct on the head. Grayish brown above, whitish beneath. Fine keeled granules on the body.....*S. molei* Bættger

Family IGUANIDÆ.

KEY TO THE GENERA.

I. Femoral pores (beneath thighs) absent.

A. Digits more or less dilated, or depressed, with smooth transverse platelets beneath, the distal joint narrower, cylindrical, or compressed. No transverse folds on throat. Vertebral fold feebly developed, or absent. Tympanum distinct. Male with appendage on throat.

1. Distal joint raised above the one next to it. Digits more or less dilated. Usually pterygoid teeth in roof of mouth.

Anolis Daudin

2. Distal joint not raised. Digits scarcely dilated. No pterygoid teeth..... *Norops* Wagler

B. Digits not dilated.

1. Plates beneath digits distinctly keeled or several-ridged.

a. Head more or less produced behind. A transverse throat fold, but no sac. Toes with dermal lobes on outer sides. Pterygoid teeth..... *Basiliscus* Laurenti

b. Head not produced behind.

x. A transverse throat-fold, or a very large occipital (or interparietal) shield, much larger than the eye opening. No sac on throat.

y. Digits straight, or nearly so. Pterygoid teeth.

z. Digits long and slender, toes strongly "toothed" laterally. Upper head-scales strongly keeled or tubercular. Strong transverse throat-folds. Body and tail crested..... *Uranoscodon* Kaup

z'. Digits compressed. Upper head-scales large, smooth. A strong curved or oblique fold on each side in front of shoulder, not extending across throat. Frequently a transverse fold in front of the latter. No crest on back.

Tropidurus Wied

y'. Digits laterally bent at the joints, compressed.

z. Scales of tail small, or moderately large. Upper head-scales keeled, or with granular prominences, large. Occipital plate very large about half as wide as head. Neck strongly folded beneath, fold forming a pair of pouches on each side. Tail long, cylindrical, or compressed. A vertebral crest. Pterygoid teeth present or absent

Plica Gray

- z'. Scales of tail very large and spiny. Upper head-scales moderate, granular. Two transverse throat-folds. Lips swollen. Tail short, flat. No vertebral crest. No pterygoid teeth..... *Urocentron* Kaup
- x'. No transverse throat-fold. Occipital shield small. A large appendage on throat. Body compressed. Pterygoid teeth..... *Tropidodactylus* Boulenger
2. Plates beneath digits smooth, or indistinctly keeled. Occipital shield slightly enlarged. A transverse throat-fold. No throat-sac. A slight crest or denticulation on back. Pterygoid teeth..... *Enyalius* Wagler
- II. Femoral pores in both sexes. Digits compressed. Pterygoid teeth. Body compressed.
- A. Third and fourth toes about equal. No transverse throat-fold. No crest on back..... *Polychrus* Cuvier
- B. Fourth toe much longer than third. A transverse throat-fold. A large non-dilatable throat-appendage. A lobed vertebral crest..... *Iguana* Gronovius

KEY TO THE SPECIES.

Genus ANOLIS Daudin.

- I. Forehead definitely concave. Vertebral fold feeble, or absent.
- A. Short frontal ridges. Canthus rostralis (ridge from forward angle of eye-opening to snout) feeble, three or four canthal scales. Ear-opening moderately large, vertically oval. No vertebral fold. Moderate throat-appendage, indicated in female. Occipital shield larger than ear-opening, separated from the supra-orbital shields by two or three rows of scales. Loreal rows (between eye and nostril, on side of head) five or six. Six to eight upper labial shields to below center of eye. Fourteen to sixteen platelets under phalanges II and III of the fourth toe. Tail slender, roundish. Total length not quite five inches. Gray-brown or olive above, with metallic green or coppery gloss. Frequently a light dark-edged cross-band between the eyes. Irregular darker spots. Other variable markings. Beneath, whitish, sometimes brown-dotted..... *A. fusco-auratus* D'Orbigny
- B. No frontal ridges. Canthus rostralis well marked.
1. Canthus rostralis short, two canthal scales. No vertebral fold. Upper head-scales keeled. Ear-opening rather large, vertically oval. Throat-appendage large, less developed in female. Scales of throat obtusely keeled.

Occipital shield small, smaller than ear-opening. Loreal rows seven to nine. Seven upper labial shields to below center of eye. Sixteen to eighteen platelets under phalanges II and III of the fourth toe. Tail rounded. Total length about five inches. Uniform coppery above, sometimes with darker spots or a light vertebral line. Beneath whitish, with metallic gloss.

A. schiedii (Wiegmann)

2. *Canthus rostralis* longer, four or five canthal scales. Male with feeble vertebral fold. Digital expansions well developed. Upper head-scales smooth.
 - a. *Canthus rostralis* rather obtuse, becoming sharp in front of eye. Four or five canthal scales. Ear-opening moderate, vertically suboval. Throat-appendage rather large, not developed in female. Scales of throat smooth. Occipital shield larger than ear-opening. Loreal rows four or five. Five to six upper labial shields to below center of eye. Twenty-two to twenty-six platelets under phalanges II and III of fourth toe. Tail compressed, with feebly serrated upper edge. Body above brownish or greenish, often with a dark network, enclosing whitish spots. Beneath whitish, or greenish, with metallic gloss. Total length eight inches.....*A. aneus* Gray
 - b. *Canthus rostralis* sharp, four canthal scales. Ear-opening moderate, suboval. Throat-appendage well developed in male, very small in female. Scales of throat smooth or obtusely keeled. Occipital shield at least as large as ear-opening. Loreal rows four to six. Seven to nine upper labial shields to below center of eye. Twenty-six to twenty-eight platelets under phalanges II and III of fourth toe. Tail feebly compressed. Purplish above, with scattered round white dots. Sometimes a vertebral series of light spots. Beneath, purplish or greenish. Length about 10.5 inches.....*A. punctatus* Daudin

II. Forehead scarcely or not concave. No vertebral fold.

- A. Occipital shield at least as large as ear-opening. Digits feebly dilated.
 1. Two or more vertebral series slightly larger than other scales of back. Tail rounded. Body grayish above, with metallic gloss, and oblique brown bands towards tail. Brown cross-bands on tail and limbs. Sides of head and neck marbled with brown. Beneath greenish white. Length about 4.25 inches.....*A. nitens* (Wagler)

2. Scales of back not larger in vertebral series. Frontal ridges absent, or short and feeble. Scales of the supra-orbital semicircles (above, between eyes) enlarged, separated by one or two series of scales. Throat-scales keeled. Upper head-scales each with one to three minute ridges. Loreal rows five to seven. Seven to nine upper labial shields to below center of eye. Tail rounded. Body brownish above, often a dark cross-band between the eyes. Back with indistinct symmetrical dark markings and metallic reflections. Flanks frequently with round black dots. Sometimes a light dark-edged vertebral line, wider behind. Beneath whitish, sometimes dotted, or with a black longitudinal streak. Length about 7.75 inches.....*A. chrysolepis* Duméril & Bibron

B. Occipital shield smaller than the ear-opening. Digits feebly or moderately dilated. Canthus rostralis distinct and angular. Throat-scales keeled.

1. Fourteen platelets under phalanges II and III of fourth toe. Frontal ridges absent. Seven loreal rows. Upper head-scales minutely one- to three-ridged. Snout short, swollen between nostrils. Ear-opening rather large, suboval. Ten to eleven upper labial shields to below center of eye. Canthus rostralis short. Throat-appendage very small, black. Limbs short and slender. Scales of vertebral region almost as large as those beneath body. Tail rounded. A dark transverse band between the eyes. Golden-brown above, with black flecking and cross-bands. Length about 5.6 inches.

A. lentiginosus O'Shaughnessy

2. More than sixteen platelets under phalanges II and III of fourth toe. Frontal ridges distinct, but short. Eight to ten loreal rows. Eight to ten upper labial shields to below center of eye. Large oval ear-opening slightly oblique from horizontal. Occipital shield nearly as large as ear-opening. Canthal scales two or three. Throat-appendage small, nearly as much developed in the female as in the male. Upper head-scales small, keeled. Tail rounded. Above, olive or brownish, with metallic reflections; usually with large angular dark spots, sometimes confluent. A dark cross-band between the eyes. Sometimes a light, dark-edged vertebral line. A large dark blue spot on each side of throat-appendage. Beneath whitish, with metallic reflections; often a blackish longitudinal line. Total length about 9.75 inches.

A. scypheus Cope

3. Eighteen to twenty-one platelets under phalanges II and III of fourth toe. Ear-opening moderate, oval. Five or six labial shields to below center of eye. Four or five loreal rows. Occipital shield nearly as large as ear-opening. Canthal scales two or three. Throat-appendage moderate in male, indicated in female. Upper head-scales sharply keeled. Tail compressed, with slightly serrated upper edge. Body compressed. Brown above, with golden gloss, uniform or spotted with darker. Sometimes with three pale longitudinal vertebral lines, and lines from axilla to groin. Beneath whitish, with metallic gloss. Total length about six inches.

A. sagrei Cocteau

Genus NOROPS Wagler

Body slender. Five upper labial shields to below center of eye. Throat-scales keeled. Body-scales both above and beneath large, sharply keeled. Scales of sides smaller and keeled. Golden-brown above, with variable darker spots. Sometimes a dark band; if present, usually bordered below by a white one, extending over ear from eye to side of body. Beneath whitish or yellowish. In males a throat-appendage, blue, or with a bluish spot. Total length about 7.25 inches..... *N. auratus* (Daudin)

Genus BASILISCUS Laurenti

A large lizard, about thirty-two inches long, when fully grown. Head-crest in male more or less regularly hood-shaped, rising from an imaginary line connecting the upper borders of the ear-openings (hardly developed in female). Crest on back much developed, sometimes as high again as body, supported by bony rays. Toes with strong lateral fringe. Snout pointed. Eye-opening large. Upper labial shields large, six or seven to below center of eye. Olive-brown above, with more or less distinct angular black cross-bars. Light bands from temple to neck and from loreal region to forelimb.

B. basiliscus (Linnæus)

Genus URANOSCODON Kaup

Lizard about a foot and a half in length. Head moderately large, short, rounded. Five or six labial shields, upper and lower. No throat-pouch; scales of throat keeled. Pterygoid teeth. Limbs long. Tail strongly compressed, crested like the back. Brownish above, uniform or spotted with darker. Often a light irregular band from arm-pit to groin. Beneath brownish white. . *U. superciliosus* (Linnæus)

Genus TROPIDURUS Wied

- I. Upper body-scales small, but slightly larger than those beneath. A fringe of long scales in front of ear. Olive or brownish above, usually a more or less distinct light and a dark band on either side of the back. A strong black-banded slightly curved fold before the arm, widely separated from its fellow. One or two more or less marked transverse throat-folds. Sides of neck granular, with one or two oblique folds, or pouches. Occipital shield very large. Beneath yellowish, or grayish, often marbled in front with blackish. Animal about ten inches long.

T. torquatus torquatus (?) (Wied)

- II. Upper body-scales at least twice as large as those beneath. No light bands along body. Otherwise much like *T. torquatus torquatus* (Wied).....*T. torquatus hispidus* (Spix)

Genus PLICA Gray

- I. Sides of neck feebly folded, without spines. A strong oblique fold in front of arm, bearing a broad black band, often showing a yellowish spot in front. A feeble longitudinal and a strong transverse throat-fold. Reddish or purplish above, with more or less distinct blackish cross-bands. Brownish or yellowish beneath. Almost a foot in length.....*P. umbra* (Linnæus)
- II. Sides of neck with tufts of small erect spine-like scales. Neck constricted and strongly folded and pouched beneath. Rear-most throat-fold continuous with a lateral fold, curving above the shoulder, and ending above the hind limb. Grayish to blackish above, spotted or marbled with darker. Dark cross-bars on limbs and sometimes on back. Whitish beneath, a collar of black marblings. Throat black in adults. Total length about sixteen inches.....*P. plica* (Linnæus)

Genus UROCENTRON Kaup

A small lizard, not quite five inches long. Sides of neck irregularly folded. Tail shorter and narrower than the body, flat beneath, about twice as broad as deep, with whorls of large obtusely keeled spiny scales. Azure-blue or olive above, with crescentic black cross-bands. Beneath greenish or yellowish.....*U. azureum* (Linnæus)

Genus TROPIDODACTYLUS Boulenger

Snout sharp, canthus rostralis very short. Upper head-scales many-ridged. Eleven or twelve plates on upper lip to below center of eye. Throat-scales keeled. Yellowish brown above, marbled with dark brown. A dark cross-band between the eyes. A row of dark spots with lighter centers along each side of back. Throat-sac blackish. Length 8.5 inches.....*T. onca* (O'Shaughnessy)

Genus ENYALIUS Wagler

Upper head-scales small, smooth or feebly keeled. Pale brownish above, with an alternating series of squarish brown spots along the middle of the back. A brown band from eye to shoulder. Whitish beneath. Length about nine inches. *E. bibroni* Boulenger

Genus POLYCHRUS Cuvier

Upper head-scales enlarged, smooth, or feebly granulated, or lined. Eye-opening small, smaller than tympanum. Tail nearly three times as long as head and body. Color and markings very variable. Reddish brown above, with blackish spots or symmetrical transverse markings. Furrows between head-shields black. Black lines radiating from eye, the two most constant being to above tympanum and to angle of mouth. Lighter beneath, uniform, or brown-spotted. Full grown males are sixteen inches long, females larger.

P. marmoratus (Linnæus)

Genus IGUANA Gronovius

Very large (fifty-five inches) with a continuous lobed crest on neck, back, and tail. Snout rounded, with obtuse canthus rostralis. Pterygoid teeth. Nostril large, pierced in a swollen nasal, near tip of snout. Tympanum large, oval. Forward border of the throat-appendage with a crest of large triangular compressed scales. A large circular shield below tympanum. Scales of back very small, equal, keeled. Green, or greenish, lighter beneath. Upper surface usually variegated with darker and lighter. Usually with dark, light edged irregular bars down flanks. Tail with dark rings. Usually a whitish streak in front of arms. *I. iguana* (Linnæus)

Family TEIIDÆ.

KEY TO THE GENERA.

- I. Nostril pierced in a nasal head-shield, or in the furrow between the two nasals, on either side of head. Limbs well developed.
 - A. Right and left forward nasal shields not separated by the fronto-nasal. Plates beneath body. Tympanum exposed. No transparent disk in lower eyelid.
 1. Scaly portion of tongue not much widened; frequently retractable into a basal sheath. Not, or but feebly, nicked behind.
 - a. Plates beneath body small, forming more than twenty longitudinal series. A double collar-fold. Large lizards.

- x. Tail not, or but feebly, compressed. Scales of back small, uniform. Eight or nine lower labial shields.
Tupinambis Daudin
 - x'. Tail strongly compressed, with a double longitudinal keel above. Scales of upper surfaces intermixed with large keeled tubercles. Eleven to thirteen lower labial shields. *Dracæna* Daudin
 - b. Plates beneath body large, forming less than twenty longitudinal series. Five or six lower labial shields.
 - x. Plates beneath body keeled. Collar-fold single.
Kentropyx Spix
 - x'. Plates beneath body smooth. Collar-fold double.
Ameiva Meyer
- 2. Scaly portion of tongue arrow-headed, cleft, not retractile.
 - a. Tail rounded. Head-shields large, regular. Shields beneath body in less than twenty longitudinal rows. Collar-fold double. *Cnemidophorus* Wagler
 - b. Tail strongly compressed, twice ridged above. Scales of back small, uniform. One collar-fold.
Crocodilurus Spix
- B. Right and left nasal shields widely separated by one or two fronto-nasals. Tongue moderately elongate, arrow-headed. Lower eyelid with a transparent disk. Tympanum exposed.
 - 1. Tail compressed, with a double toothed crest. A collar-fold. Back covered with small, intermixed with large, keeled scales. Plates beneath body.
Neusticurus Duméril and Bibron
 - 2. Tail round or somewhat four-sided. Transparent disk of lower eyelid composed of several scales. Dorsal scales strongly keeled.
 - a. No collar-fold. *Leposoma* Spix
 - b. A strong collar-fold. *Euspondylus* Tschudi
- II. Nostril pierced between the nasal and the first labial head-shields. A fronto-nasal, separating the nasals. No ear-opening. Digits rudimentary, or absent. Digits, if distinct, clawless. Scales of back quadrangular. No plates beneath body. Tongue moderately elongate, arrow-headed. Eyes minute; eyelids developed. No collar-fold. Hind limbs undivided. . . *Bachia* Gray
- III. Nostril in the lower part of a single more or less bisected nasal shield. Nasal shields widely separated by a fronto-nasal. Ear exposed. Inner finger, if distinct, clawless. A transparent disk in lower eyelid. No plates beneath body. No collar-fold.

- A. Prefrontal head-shields moderate and forming a short suture. Scales of tail lanceolate, keeled. Two loreal shields. All scales roundish-hexagonal, overlapping, smooth. Two rows along back, and two along belly, much dilated transversely.
Iphisa Gray
- B. Prefrontal shields small and widely separated. Scales of tail smooth. One loreal shield..... *Calliscincopus* Ruthven

KEY TO THE SPECIES.

Genus TUPINAMBIS Daudin.

- I. Two loreal plates. Temples with small granular scales. Scales of back oval, flat. Thirty-six to forty scales across the middle of the belly. Olive above, marbled and transversely barred with black, and with rows of lighter spots. Black cross-bands beneath, on yellow brown. Furrows between the plates on upper surfaces of head black. About a yard in length.
T. teguixin (Linnæus)
- II. One loreal plate. A few large plates bordering the temple superiorly. Scales of back regularly hexagonal, flat. About thirty scales across middle of belly. No black cross-bands beneath. Head with large black spots above. About a yard in length.
T. nigropunctatus Spix

Genus DRACÆNA Daudin.

A large lizard. Scales of back small, irregular, intermixed with irregularly arranged large oval strongly keeled tubercles. Four or five small pores on each side in front of the region of the vent, and two or three under each thigh. Olive-brown above. Flanks with lighter spots. Yellowish beneath, marbled with blackish. Furrows between the labial shields and chin-shields black. Length when grown, thirty-three inches..... *D. guianensis* Daudin

Genus KENTROPYX Spix

- I. Scales of vertebral line much larger than the laterals; strongly overlapping, keeled. Border of collar-fold strongly toothed, formed of twelve or thirteen plates.
 - A. Scales along vertebral line very large, with sharp keels forming fourteen straight longitudinal rows. Color olive, a few black spots on each side of body in general region of fore limbs. Length twelve inches..... *K. striatus* (Daudin)
 - B. Scales along vertebral line smaller, the keels not continuous, and directed toward the median line of the back. Above olive; beneath greenish white. A light line on each side,

beginning from the eye, bordered above and beneath by a broad black band, or a series of black spots. A second, more or less distinct, beginning from the ear. Almost fourteen inches long..... *K. intermedius* (Gray)

- II. Scales along vertebral line a little larger than those on sides of body; hexagonal, keeled. Edge of collar not, or but slightly, toothed; the last row of the band in front of the collar-fold containing fifteen or sixteen plates sometimes separated from the fold by granules. Olive above, a light line on each side, commencing from the eye, bordered below and sometimes above by a row of black spots, sometimes confluent into a band. Sometimes other lines and spots. Eleven inches long.

K. calcaratus Spix

Genus AMEIVA Meyer

Twelve longitudinal and thirty to thirty-three transverse rows of plates beneath the body. Scales of tail straight, feebly keeled. Femoral pores less than twenty-three on each side. Nostril between the nasal plates. A broad band of enlarged scales across the throat. Granules of back small, smooth. Shields of forearm in two or three rows; the outer row wider than the others. Above pale olive-brown, tinged with green. Head, neck, and arms spotted with black. White spots on sides. Young with a black white-edged band on each side, commencing from the eye. Female fifteen inches in length; male larger..... *A. ameiva ameiva* (Linnæus)

Genus CNEMIDOPHORUS Wagler

- I. Ten to twelve longitudinal and thirty-five to forty-two transverse rows of plates beneath the body. Arm-shields small. Femoral pores twenty-seven to forty-five. Scales of the band in front of the collar-fold separated from free edge of collar by four or five rows of granules. Brown to olive above; sides with bluish white spots. Yellowish to slaty beneath. Total length of adult 17.5 inches..... *C. murinus murinus* (Laurenti)
- II. Plates beneath body in eight longitudinal rows. Large arm-shields. Femoral pores fifteen to twenty-seven. Scales of the band in front of collar-fold separated from free edge of collar by one to three rows of granules. Olive to bluish, with six to ten light longitudinal stripes, or without stripes. Whitish spots on limbs. Greenish white beneath. Female 8.5 inches long; male longer..... *C. lemniscatus lemniscatus* (Linnæus)

Genus CROCODILURUS Spix

Scales of back small, elongate, oval, slightly keeled or peaked. Abdominal plates with the rear border rounded, in twenty-four longi-

tudinal and thirty-seven transverse series. Femoral pores very small, rather indistinct, six to ten in number. Brown above, dotted with black. Yellowish beneath, with scattered blackish spots. Digits with black rings. Length 20.5 inches. *C. lacertinus* (Daudin)

Genus NEUSTICURUS Duméril & Bibron

- I. Transparent disk of lower eyelid composed of several pieces. Olive-brown above, with darker spottings. Three vertical dark brown bars on upper eyelid. More or less distinct white spottings on flanks. Snout pointed. Diameter of ear half that of eye. Eleven inches long. *N. bicarinatus* (Linnæus)
- II. Transparent disk of lower eyelid undivided. Brown above, spotted with darker. Usually white spotting on flanks, and axilla black. Snout more obtuse. Ear-opening almost as large as eye. Less than seven inches long. *N. ecpleopus ecpleopus* Cope
- III. Transparent disk of lower eyelid composed of five pieces. Uniform blackish brown above, whitish beneath. Snout rather short, pointed. Ear-opening as large as eye-opening. About seven inches long. *N. rudis* Boulenger

Genus LEPOSOMA Spix

- I. Chin-shields, one in front and three pairs, the members of the first two pairs in contact. Twenty-three or twenty-four scales around middle of body. Thirty-four scales from occiput to base of tail; thirty-three from third pair of chin-shields to the vent. Yellowish brown above, with three or four rows of small black dots on the back. Lower surfaces yellowish. Four inches long. *L. scincoides* Spix
- II. Chin-shields, one in front and three pairs, the members of the pairs in contact, except those of the third pair separated by a single scale. Twenty-five to twenty-nine scales around middle of body, thirty-five to thirty-nine from occiput to base of tail, and forty from the third pair of chin-shields to the vent. Reddish to yellowish brown above, whitish beneath, a broad band of dark brown extending along either side of head and body. Just under four inches long. *L. percarinatum* (Müller)
- III. Chin-shields, four pairs, the members of the first three pairs in contact. Thirty-two or less scales from occiput to base of tail. Dark brown above, black dotted. On each side of the back a light line, commencing from the region above the eye. Sides of the head with oblique black lines. Lower surfaces yellowish white. Just over four inches long. *L. dispar* Peters

Genus EUSPONDYLUS Tschudi

Snout short, obtusely pointed. Dorsal scales hexagonal. Lateral scales small, roundish, smooth. Black above and beneath, each scale or shield with one to three white dots, the dots larger on the ventral shields. Chin white. Animal about five inches long.

E. leucostictus (Boulenger)

Genus BACHIA Gray

- I. Two supraocular shields. Fore limb with three or four unclawed digits. Scale-rows of body; thirty longitudinal; forty-seven to fifty transverse. Brown, back lighter. Two or three longitudinal darker lines. Almost five inches long.

B. cophias (Schneider)

- II. One supraocular shield. Fore limb with three unclawed digits. Hind limb undivided. Scale-rows of body; twenty-six to twenty-eight longitudinal; fifty to fifty-one transverse. Back reddish brown, with paler vermiculations. Sides blackish, with a pale stripe. Head bluish black, iridescent. Pale yellowish beneath. Six inches long..... *B. parkeri* Ruthven

Genus IPHISA Gray

Head depressed; snout short and broad, truncate. Body elongate, limbs short. Tail long, tapering to point. Chestnut brown above, with small dark marblings. Yellowish white beneath. A more or less distinct light lateral line, separating the lighter upper surface from the blackish brown of the sides. Not quite six inches long.

I. elegans Gray

Genus CALLISCINCOPUS Ruthven

Body moderately elongate. Head flattened. Brown above, becoming darker towards the hind limbs. A light stripe on each side from end of snout to base of tail. Sides of head, neck and body and upper surface of limbs black. Throat light green. Blue beneath. Not quite six inches long..... *C. agilis* Ruthven

Family AMPHISBÆNIDÆ.

Genus AMPHISBÆNA Linnæus

Wormlike. Eyes under skin. A distinct lateral line.

- I. Not more than two hundred and seventeen rings on body, twenty-four to thirty-two on tail. Eye distinct through the ocular shield. Black and white variegated, either the one or the other color predominating..... *A. fuliginosa* Linnæus

- II. About two hundred and forty-eight rings on the body, thirteen on the tail. Eye not distinguishable through the ocular shield. Whitish, with some dark brown segments above, and some pale brown spots beneath..... *A. stejnegeri* Ruthven

Family SCINCIDÆ.

Genus MABUYA Fitzinger.

- I. Less than thirty-three scales around middle of body. Snout obtuse. No projecting lobules on ear-opening. Limbs short. Olive or bronzy above, uniform or with darker spots. A broad dark lateral band passing through the eye, usually bordered beneath by a light streak. Animals about nine inches long.
M. agilis (Raddi)
- II. More than thirty-three scales around middle of body. Snout elongate, rather sharp. Ear-opening with minute projecting lobules or granules on its front border. Limbs long. Olive above, variegated with darker and lighter. Over nine inches long..... *M. punctata* (Gray)

THE AMPHIBIA OF BRITISH GUIANA.

KEY TO THE FAMILIES.

- I. Four limbs and no tail.
- A. Tongue absent. Eustachian tubes having a common exit from the pharynx. No tympanum..... PIPIDÆ
- B. Tongue present. Eustachian tubes with separate openings from pharynx.
1. Pupil of eye horizontal, or, in one genus, vertical. If vertical, then with distinct tympanum, and with inner finger and toe opposable.
- a. Parotoid glands (prominences behind ear and above shoulder on either side), but no vomerine teeth (in roof of mouth) or upper jaw-teeth; or no parotoid glands, but with both vomerine and upper jaw-teeth; or in genus *Allophryne*, (which see) neither parotoids, vomerine teeth, nor upper jaw-teeth, and tympanum hidden. If teeth, then one or more of the following additional characters:—a discoidal fold beneath the body; a tarsal fold; toes fringed; color black; head enormous, elevated, bony, upper eyelid with heavy appendage; a lumbar gland; tubercle on upper eyelid. Tubercles beneath digits and beneath metatarsals..... BUFONIDÆ

- b. Either parotoid glands or vomerine teeth or both. Teeth in upper jaw. Head more or less depressed. Both fingers and toes dilated into terminal disks. Body more or less granulated beneath.....HYLIDÆ
- c. Neither parotoid glands nor vomerine teeth. Teeth in upper jaw absent or present. If present, then toes webbed. Fingers free.....BRACHYCEPHALIDÆ
- d. No parotoid glands, but both vomerine and upper jaw-teeth. Fingers free. Toes entirely webbed...RANIDÆ
- 2. Pupil of eye round or vertical. If vertical, then tympanum hidden. Eyes small. Snout projecting beyond mouth. Neither vomerine nor upper jaw-teeth. Fingers free, toes webbed or free. Habit stout....BREVICIPITIDÆ
- II. No limbs. Tail rudimentary. A flap-shaped tentacle.
CÆCILIIDÆ

Family PIPIDÆ.

Genus PIPA Laurenti

No teeth in upper jaw. A large dermal flap at angle of mouth. One or two short tentacles on upper lip in front of eye. Head extremely depressed, triangular. Eye minute.....*P. pipa* (Linnæus)

Genus PROTOPIA Noble

Teeth in upper jaw. No dermal flap at angle of mouth. No dermal filament on upper lip. Neither head nor body greatly flattened. Snout rounded, not angular. Skin rough, tubercular.

P. aspera (Müller)

Family BUFONIDÆ.

KEY TO THE GENERA.

- I. No vomerine teeth, but with parotoid glands. Toes more or less webbed.....*Bufo* Laurenti
- II. Vomerine teeth, but no parotoid glands.
 - A. Toes free or slightly webbed.
 - 1. Digits not, or but slightly, dilated at tips.
 - a. No conspicuous lumbar gland.
Leptodactylus Fitzinger
 - b. A very prominent oval lumbar gland, as large as eyeball.....*Pleurodema* Tschudi
 - 2. Digits with medium or large disks.
Eleutherodactylus Duméril & Bibron

- B. Toes webbed to tips. Digits pointed or slightly dilated at tips..... *Pseudis* Wagler
- C. Toes two-thirds to three-fourths webbed. Head very large, bony, horny..... *Ceratophrys* Boie

III. Neither vomerine teeth nor parotoid glands... *Allophryne* Gaige

KEY TO THE SPECIES.

Genus BUFO Laurenti

- I. Grayish brown or blackish beneath, with round light dots. Brown above. Cranial ridges none, or indistinct. A rather indistinct tarsal fold. Parotoid glands large, but depressed, and descending to armpit..... *B. guttatus* Schneider
- II. Immaculate beneath, or with dark spots. Head with bony ridges.
 - A. Angles of jaws projecting. Parotoid glands rather small, angular. No tarsal folds. Ridges on head very prominent and bony in adult. Above, brownish, with a few black spots. Small warts, forming lateral folds.... *B. typhoni* (L.)
 - B. Jaws normal. Very large parotoid glands. Tarsal folds. Brownish above, usually with large darker spots. Skin very rough..... *B. marinus* (L.)

Genus LEPTODACTYLUS Fitzinger.

- I. Toes without distinct dermal margins.
 - A. Tips of toes dilated into small but distinct disks.
 - 1. First finger not extending beyond second. Granular above, with longitudinal folds and rows of warts. A discoidal fold beneath. Brown above, marbled with darker, a dark band between the eyes. Hind limbs cross-barred. Hinder side of thighs dark brown, marbled with white..... *L. hylædactylus* (Cope)
 - 2. First finger extending slightly beyond second. Above, closely set tubercles. Smooth beneath. Blackish brown above, with white line on side of snout, upper eyelid, and on either side of back. A large spot on the loin, and smaller ones elsewhere on limbs, these spots crimson in life, whitish in alcohol. Beneath, light brown with small white dots..... *L. lineatus* (Schneider)
 - B. Tips of toes not, or but slightly, dilated.
 - 1. Tympanum at least two-thirds width of eye.
 - a. Head narrow, snout long and pointed. Back with many longitudinal folds. Dark spot on nape nearly

or quite divided. Sometimes a light vertebral stripe, accompanied by two very narrow light stripes on either side, and a light stripe beneath the thighs. Hind limbs cross-barred or marbled. A discoidal fold beneath..... *L. typhoni* (Daudin)

b. Head broader, snout more blunt.

- x. Skin smooth above, generally with large flat glands on the flanks. Brownish above. A black stripe along canthus rostralis and temporal fold. Generally with dark spots arranged in transverse bars on the back. Limbs cross-barred. Thighs marbled behind with black and yellow. A glandular fold from eye over tympanum to shoulder. Generally another along each side of the back to the sacral region. Beneath, a more or less distinct discoidal fold. Very large and stout.

L. pentadactylus (Laurenti)

- y. Skin smooth, with distinct pores, each surrounded with a whitish halo, on the upper surfaces of thighs, calves, and tarsi. Reddish brown to violet-rose above. A well-accentuated "moustache." Flanks with slightly prominent oval glands and incomplete black rings. A fold above the tympanum, curved to the arm. Beneath, a discoidal fold. A deep black streak on either side of the back. Other black and some white markings. No white line on thigh..... *L. mystacinus* (Burmeister)

- z. Skin very rugose above, some of the tubercles forming short elevated longitudinal lines. Warts on eyelids and a few on the snout. Reddish brown above, with paler markings, especially on upper lip and thighs. Straw-color beneath, heavily blotched with brown, especially beneath skin.

L. rugosus Noble

2. Tympanum not two-thirds width of eye.

- a. A narrow glandular lateral fold, partly white, from eye to groin, and one over tympanum. Skin minutely granular. A fine elevated mid-line from snout to vent. Brown above, with darker markings. A light-edged band between the eyes. A broad dark "moustache" stripe on canthus, and running through eye to tympanum. This stripe with an equally prominent white stripe beneath it. Limbs cross-barred. A white longitudinal stripe on the thighs. Beneath, a discoidal fold..... *L. mystaceus* (Spix)

- b. No dorsal folds. Size very small. Skin slightly glandular. Dull olive-gray above, with darker spottings. Three, sometimes irregular, pale stripes running the length of the back. Dark spots form cross-bars on limbs. Almost immaculate beneath. A ventral discoidal fold..... *L. minutus* Noble

II. Toes with distinct dermal margins.

- A. A fold from eye to groin on either side, with another over tympanum. Canthus and these folds dark brown. Skin smooth or slightly granular. General coloration of back reddish or chestnut. Thighs very dark behind, with three or four rows of irregular white dots. Three or four diffuse dark bars on upper side of thighs..... *L. stictigularis* Noble
- B. No extensive longitudinal folds, except from eye to forearm over tympanum.
 - 1. Skin smooth, with a few scattered warts. Brownish or olive above, with darker markings. A large dark brown, black-edged, angular spot on the occiput. Beneath, white, always reticulated or vermiculated with brown or gray. Thighs light brown above, crossed by a few short wide slanting darker bars..... *L. caliginosus* Girard
 - 2. Similar, but color deep yellow to reddish brown. Lighter and darker spots. A dark stripe between the eyes, from which a light ivory-colored area extends forward. Tympanum close to eye, very large, ivory-color. Under side nearly white, little vermiculated.... *L. pallidorostris* Lutz

Genus PLEURODEMA Tschudi.

Snout rounded, as long as diameter of eye. Tympanum indistinct. First finger extending considerably beyond second. Toes short, a rudimentary web extending as a slight fringe along the sides. A few small flat warts above. Olive-brown, with a few indistinct darker markings. A large black spot on inguinal region, sometimes including gland. Loins and hinder side of thighs rose. Upper sides of thighs with one to three large black spots. Sometimes a light vertebral line.

P. brachyops (Cope)

Genus ELEUTHERODACTYLUS Duméril & Bibron.

Skin smooth above. Belly granular. Gray-brown above, with dark brown markings and marblings.

- I. Digits with disks nearly as large as tympanum. The latter one-fourth diameter of eye. Feeble oblique glandular ridges on back of head. Limbs cross-barred; dark bars radiating from eye.

E. marmoratus (Boulenger)

- II. Disks much smaller than tympanum. The latter two-fifths diameter of eye. A small tubercle on upper eyelid and a curved fold over tympanum. Sides indistinctly granular. Sometimes a triangular light blotch between eyes. Limbs indistinctly cross-barred. Groin, upper anterior and lower posterior surface of femur and inner face of tibia, carmine. . . *E. urichi* (Boettger)

Genus PSEUDIS Wagler.

Snout tapering. Interorbital space broader than upper eyelid. Tympanum three-fourths diameter of eye. Fingers and toes pointed. Skin smooth, brownish above, with dark markings. Beneath with brown spots and vermiculations on creamy background.

P. paradoxa (L.)

Genus CERATOPHRYS Boie.

Head large, elevated. A broad ridge from eye to above tympanum. Eye very small. Upper eyelid produced in a horn-like appendage, the length of which equals the diameter of the eye. Upper surfaces with small tubercles, larger and conical on the flanks; beneath, granular. Grayish, head and back with dark markings, sides marbled with brown. Limbs with regular dark cross-bars. *C. cornuta* (L.)

Genus ALLOPHRYNE Gaige.

Head very small, broader than long. Tips of fingers and toes dilated into disks. No tympanic disk. Snout rounded. Back distinctly porous, with small pustulations, especially on snout, eyelids, and sides of head. A few of these pustulations tipped with a tiny spine. Fold from eye to shoulder and one across throat. Dark gray above, lighter beneath. Head dark; back with dark spots.

A. ruthveni Gaige

Family HYLIDÆ.

KEY TO THE GENERA.

- I. Pupil of eye horizontal. Toes more or less webbed. Tongue adherent or moderately free behind. *Hyla* Laurenti
- II. Pupil vertical. Toes free or shortly webbed. Tongue extensively free behind. *Phyllomedusa* Wagler

KEY TO THE SPECIES.

Genus HYLÆ Laurenti.

- I. Choanæ (internal openings of nasal passages) large. Vomerine teeth in two strong series, transverse, or forming together a trough, an arch, or a chevron.
- A. At least the outer fingers more than one-third webbed.

1. A projecting rudiment of pollex (in the form of a tubercle, or acute claw). Coloration beneath immaculate.

- a. Outer fingers entirely webbed. Tympanum two-thirds diameter of eye. Skin minutely granulated above, and coarsely beneath. Heel with a triangular dermal appendage. Brown or reddish brown above, variegated with lighter and darker. Limbs usually with dark cross-bars. Sometimes a dark vertebral line from tip of snout to sacrum.

H. maxima (Laurenti)

- b. Outer fingers two-thirds webbed. Tympanum one-half diameter of eye. Skin smooth above. Heel with a very short triangular dermal appendage. A narrow glandular lateral fold. Yellowish or light reddish brown above, closely and minutely dotted with brown..... *H. albomarginata* Spix

- c. Outer fingers half webbed, or nearly so. Skin granulate, or with tubercles on upper surfaces.

- x. Tympanum nearly two-thirds diameter of eye. Upper surfaces with scattered tubercles; in color brownish, dotted and marbled with darker. Limbs more or less cross-barred. Perhaps vertical dark bars on sides of body and thighs.

H. pardalis Spix

- x'. Tympanum one-half diameter of eye, or less. Upper surfaces granulate. Almost colorless, with scattered purple dots. Upper eyelid rose.

H. granosa Boulenger

2. No projecting rudiment of pollex.

- a. Outer fingers nearly half webbed. Body large. Tympanum nearly as large as eye. Borders of fronto-parietals forming two strong ridges. Reddish or blackish brown above, spotted or marbled with darker and lighter. Limbs with broken dark cross-bands. Flanks sometimes white-spotted. Throat and chest spotted. Skin smooth above.

H. taurina (Fitzinger)

- b. Fingers two-thirds webbed. Body medium size. Greatest diameter of tympanum (inconspicuous) less than one-half greatest diameter of eye. Ground-color straw. Two dark, pink-bordered spots on snout. A dark bar between the eyes. A diamond-shaped spot in front of pelvis..... *H. ornatissima* Noble

- B. Fingers one-third webbed, or nearly so. Tympanum two-thirds diameter of eye.
1. Head broader than long. Region between nostril and eye oblique. Fingers one-third, or one-fourth webbed. Light brown above, marbled with darker. Sides of body and of thighs (at least of hinder part) with vertical dark slender stripes. *H. crepitans* Wied
 2. Head as long as broad. Region between nostril and eye not very oblique. Three outer fingers one-third webbed. Grayish or reddish above, with darker and lighter markings. Smooth or tubercular above. A fold above tympanum. Sides of body immaculate. Upper surface of limbs with wide dark cross-bands.
H. lepriouri Duméril & Bibron
- C. Fingers with slight rudiments of web.
1. Tympanum one-half diameter of eye.
 - a. Region between nostril and eye oblique. Skin smooth above. Heel with a dermal spur. Reddish brown above, a dark brown vertebral line beginning from tip of snout. Sides of body and limbs with vertical black bars. *H. fasciata* (Schneider) (?)
 - b. Region between nostril and eye concave. Snout shorter than diameter of eye. Canthus rostralis distinct. Interorbital space much wider than upper eyelid. Above deep green, with numerous distinct brown spots. Legs marked with yellow, orange, and brown. *H. helenæ* Ruthven
 2. Tympanum about two-thirds diameter of eye. A narrow glandular fold from eye above tympanum to back, lost behind shoulder. Head rather narrow, otherwise much like *H. lepriouri*. Above skin smooth, color reddish brown, or grayish. Head, body, and limbs with slender cross-bands. A white line above anus. *H. boans* Daudin
- D. Fingers quite free. Region between nostril and eye very oblique and concave. Tympanum three-fifths diameter of eye. Brown above, spotted with darker. Limbs with regular dark cross-bands. Breast and limbs specked with brown. Female carries eggs on back. . . . *H. evansi* Boulenger
- II. Choanæ small or moderate. Vomerine teeth in two short series, transverse, or obliquely directed backwards and inwards, on a level with the hinder edge of the choanæ or a little behind them.
- A. Fingers more than one-third webbed.
1. Web reaching disks of second and fourth fingers. Tympanum very distinct, nearly two-thirds diameter of eye.

- a. Web reaching disk of third finger. Forearm and tarsus with a denticulated fringe. Upper surfaces slightly warty. Reddish brown above, marbled with dark brown. Hind limbs with dark cross-bars. Beneath, bright saffron, with small round black dots. Extremities black. Webs black and saffron.

H. marmorata (Laurenti)

- b. Web not reaching disk of third finger. Skin thick, leathery, minutely pitted above. Chestnut-brown above, a light hour-glass shaped figure between eyes and sacrum. Armpit black. *H. coriacea* Peters
2. Web not reaching disks of second and fourth fingers. Tympanum about one-half diameter of eye. Snout pointed, much projecting. Eyes small, head broad and very flat. Skin smooth or minutely granulate above, coarsely granulate beneath. A strong fold across chest. Short cutaneous flaps on either side of vent. Uniform yellowish or pinkish. A reddish brown streak on canthus.

H. aurantiaca Daudin

- B. Outer fingers one-third or one-fourth webbed. Tympanum about two-thirds diameter of eye. No tarsal fold. Upper surfaces warty. Brown above, marbled with darker. Broad dark cross-bars on hind limbs. *H. venulosa* (Laurenti)

- C. Outer finger perfectly free. Tympanum one-half diameter of eye, or a little more than that. Toes three-fourths webbed.

1. Snout twice as long as diameter of eye. Upper surfaces tubercular. Conical tubercle on heel. Brown above, marbled with darker. Throat and chest spotted with brown. *H. acuminata* Cope
2. Snout 1.5 to 1.66 times as long as diameter of eye. Smooth, or with small tubercles above, brownish. Usually a light streak along each side of back, beginning from eye. Sometimes an X-shaped dark figure. Sides of thighs sometimes black and white marbled. . . . *H. rubra* Daudin

Genus PHYLLOMEDUSA Wagler.

- I. Parotoids distinct. Vomerine teeth. Tympanum half diameter of eye. Upper surfaces bony. Blue-green above, purplish white beneath. Clearly defined light spots on sides of body, limbs, digits, and a line above anus. *P. bicolor* (Boddaert)
- II. Parotoids scarcely distinct. No vomerine teeth. Tympanum not half diameter of eye. Upper surfaces smooth. Light purplish or blue above, immaculate whitish beneath. Vertical purplish brown bands on limbs and sides of body. Colors brilliant when alive. *P. hypochondrialis* (Daudin)

Family BRACHYCEPHALIDÆ.

KEY TO THE GENERA.

- I. Teeth in upper jaw.
 - A. Toes nearly free..... *Phyllobates* Duméril & Bibron
 - B. Toes with distinct webs..... *Hyloxalus* Espada
- II. No teeth in upper jaw.
 - A. Toes more or less webbed. Habit slender.
 - Atelopus* Duméril & Bibron
 - B. No web between toes.
 - 1. No tympanum. Skin warty, especially above. Eustachian tubes very minute. Foot modified for grasping.
 - Oreophrynella* Boulenger
 - 2. Tympanum more or less distinct. Skin smooth or tubercular..... *Dendrobates* Wagler

KEY TO THE SPECIES.

Genus PHYLLOBATES Duméril & Bibron.

- I. Upper surfaces of head and body distinctly glandular. Ear concealed. First finger longer than second. Dark brown above, sides blackish, two lines on either side of head and body, one running above eye, one on upper lip. Beneath, variegated gray, or brown and white. Flash colors of pink on axilla and inguinal or femoral regions..... *P. inguinalis* (Cope)
- II. Upper surface of head and body not distinctly glandular although sometimes tubercular. First finger shorter than second. Adult, beneath, brown or spotted with dark tones. A dark bar across chest; forward part of belly generally of same dark tone.
 - P. trinitatis* Garman

Genus HYLOXALUS Espada.

Size very small. Snout rounded. Tympanum nearly two-thirds diameter of eye, rather indistinct. Digital dilations very small. First finger not so long as second. Skin smooth above, slightly granular on sides, no well defined folds on back. Bright yellow, a streak of dark brown from snout through eye to groin. Two light streaks on either side of back, from eye to pelvic region. Above dark stipplings on yellow..... *H. beebei* Noble

Genus ATELOPUS Duméril & Bibron.

- I. Fingers long and slender, first nearly as long as second. Skin covered with granular tubercles. Yellowish brown, marbled with blackish above and beneath. A narrow light vertebral line. Throat and breast black..... *A. proboscideus* (Boulenger)

II. Fingers moderate, first short or rudimentary. Skin smooth.

A. Toes nearly entirely webbed. Above blackish; beneath yellowish. Variable markings of crimson or greenish yellow above..... *A. varius* Stannius (?)

B. Toes one-third webbed.

1. Bright yellow, marbled above with brown or black. Beneath immaculate, or marbled with brown.

A. flavescens Duméril & Bibron

2. Blackish brown above, with light green markings. Beneath carmine, more or less spotted with black.

A. pulcher (Boulenger) (?)

Genus OREOPHRYNELLA Boulenger.

I. Snout short, rounded, not prominent. Digits somewhat swollen at ends. Upper surfaces very rough. Black, except variable yellow marblings or spottings beneath..... *O. quelchii* Boulenger

II. Snout prominent, projecting much beyond mouth. Digits ending in distinct truncated disks. Upper surfaces olive, with lighter marblings and yellowish spots forming a line from eye to groin on either side of back. Beneath whitish.

O. macconnelli Boulenger

Genus DENDROBATES Wagler.

I. First finger not extending so far as second. Skin smooth.

D. tinctorius (Schneider)

II. First finger extending beyond second. Skin of back tubercular. A scarcely prominent glandular lateral fold. Black, with whitish line on side of back, upper eyelid, and canthus rostralis; another line on upper lip, extending to arm. White spots on limbs, and sometimes on ventral body surface..... *D. trivittatus* (Spix)

Family RANIDÆ.

Genus RANA Linnæus.

A moderately prominent glandular lateral fold. Another glandular fold from beneath eye to shoulder. Snout rounded. Tympanum distinct, at least two-thirds diameter of eye. Tongue more or less deeply notched. First finger extending slightly beyond second. Olive or brown above, immaculate or with small blackish spots; limbs with spots arranged in cross-bars. Beneath, yellowish white with small brownish specks or spots..... *R. palmipes* Spix

Family BREVICIPITIDÆ.

KEY TO THE GENERA.

- I. Tympanum very large and close to eye. Eye rather small.
Snout short, pointed, obliquely truncated.
Otophryne Boulenger
- II. Tympanum hidden. Eye quite small. Snout very long, pointed,
strongly projecting. Forelimb very short. Hind limb stout.
 - A. Body immaculate light brown beneath.
Gastrophryne Fitzinger
 - B. Body marbled with brown beneath. A broad, sometimes
interrupted yellow line along hinder side of thigh.
Elachistocleis Parker

KEY TO THE SPECIES.

Genus OTOPHRYNE Boulenger.

Skin thick, smooth and shiny. A strong fold from eye to thigh. Blackish brown above. Groin and hinder side of thighs orange, spotted with black. Throat and chest dark brown. Beneath whitish, with some brown spots.....*O. robusta* Boulenger

Genus GASTROPHRYNE Fitzinger.

Above brown, more or less dotted with whitish. Diameter of eye one-fourth length of snout. Skin perfectly smooth.

G. microps (Duméril & Bibron)

Genus ELACHISTOCLEIS Parker.

Above brown. Diameter of eye one-half length of snout. A fold across the head behind the eyes.....*E. ovalis* Parker

Family CÆCILIIDÆ.

KEY TO THE GENERA.

- I. Two series of teeth in lower jaw.
 - A. Tentacular groove situated below nostril. Cycloid scales imbedded in skin.....*Cæcilia* Linnæus
 - B. Tentacular groove situated behind nostril. No scales.
Typhlonectes Peters
- II. A single series of teeth in lower jaw. Tentacular groove in front of eye. No scales.....*Siphonops* Wagler

KEY TO THE SPECIES.

Genus CÆCILIA Linnæus.

- I. Total length not sixty times greatest diameter of body. One hundred and thirty-five to one hundred and fifty circular folds.
C. tentaculata Linnæus
- II. Total length more than sixty times greatest diameter of body. two hundred and fifteen to two hundred and fifty-five circular folds..... *C. gracilis* Shaw

Genus TYPHLONECTES Peters.

Snout broad, rounded. Eyes distinct. Body stout, moderately elongate, becoming gradually compressed and keeled above towards posterior end. One hundred and thirty-five to one hundred and sixty-seven circular folds, interrupted on back

T. compressicauda (Dum. & Bib.)

Genus SIPHONOPS Wagler.

Snout broad, rounded, moderately prominent. Eyes distinct. Body stout, cylindrical, moderately elongate. Eighty-five to ninety-five circular folds, all complete..... *S. annulatus* Mikan.

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